

WE CLAIM:

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1. A non-invasive method for gene regulation during gene therapy, comprising the steps of:

10 introducing electromagnetic field response elements into a gene promoter not having any electromagnetic field response elements to serve as switches for regulating exogenously introduced genes; and

applying an electromagnetic field to the introduced electromagnetic field response elements to induce gene expression.

15 2. The method as set forth in claim 1, wherein the introduced electromagnetic field response elements are nCTCTn sequences in an HSP70 gene promoter.

20 3. The method as set forth in claim 2, wherein a number of the nCTCTn sequences is 3.

25 4. The method as set forth in claim 3, wherein the nCTCTn sequences lie between about -230 and about -160 in the HSP70 gene promoter.

5. The method as set forth in claim 1, wherein the introduced electromagnetic field response elements are nCTCTn sequences in a c-myc gene promoter.

6. The method as set forth in claim 5, wherein a number of the nCTCTn sequences is 8.

30 7. The method as set forth in claim 6, wherein the nCTCTn sequences lie between about -1257 and about -353 in the c-myc gene promoter.

5 8. The method as set forth in claim 1, wherein the electromagnetic field is applied at a field strength of about 8 μ T and a frequency of about 60Hz for a time of about 30 minutes.

10 9. A non-invasive method for gene regulation during gene therapy, comprising the steps of:

 introducing at least one electromagnetic field response element into a gene promoter not having any electromagnetic field response elements to serve as switches for regulating exogenously introduced genes; and

15 applying an electromagnetic field to each introduced electromagnetic field response element to induce gene expression.

20 10. The method as set forth in claim 9, wherein each introduced electromagnetic field response element is an nCTCTn sequence in an HSP70 gene promoter.

25 11. The method as set forth in claim 9, wherein each introduced electromagnetic field response element is an nCTCTn sequence in a c-myc gene promoter.

 12. The method as set forth in claim 9, wherein the electromagnetic field is applied at a field strength of about 8 μ T and a frequency of about 60Hz for a time of about 30 minutes.